

ACRONYMS AND ABBREVIATIONS

ADEQ	Arizona Department of Environmental Quality
ADMMR	Arizona Department of Mines and Mineral Resources
ADWR	Arizona Department of Water Resources
AEPCO	Arizona Electric Power Cooperative
af	Acre-feet
AGFD	Arizona Game and Fish Department
ALERT	Automated Local Evaluation in Real Time
ALRIS	Arizona Land Resource Information System
ANP	Apache Nitrogen Products Inc.
AMA	Active Management Area
ASARCO	American Smelting and Refining Company
AWPF	Arizona Water Protection Fund
AZMET	Arizona Meteorological Network
BLM	United States Bureau of Land Management
BOR	United States Bureau of Reclamation
CAP	Central Arizona Project
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CLIMAS	Climate Assessment for the Southwest
DES	Arizona Department of Economic Security
DNT	Dinitoglycerine
DOD	United States Department of Defense
ENSO	El Niño-Southern Oscillation
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FCD	Flood Control District
GIS	Geographic Information System
GRIC	Gila River Indian Community
gpcd	Gallons per capita per day
gpd	Gallons per day
gpm	Gallons per minute
GVID	Gila Valley Irrigation District
GWSI	Groundwater Site Inventory System
INA	Irrigation Non-expansion Area
LUST	Leaking Underground Storage Tank
M&I	Municipal and Industrial
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NPS	United States National Park Service
NRCD	Natural Resources Conservation District
NRCS	Natural Resources Conservation Service
NWIS	National Water Information System
NWR	National Wildlife Refuge
NWS	National Weather Service

Pan ET	Pan Evapotranspiration
PDO	Pacific Decadal Oscillation
PWUA	Pomerene Water Users Association
SDID	Saint David Irrigation District
SNOTEL	SNOpack TELEmetry
SPRNCA	San Pedro Riparian National Conservation Area
SX/EW	Solvent extraction/electrowinning
TDS	Total Dissolved Solids
TNC	The Nature Conservancy
TMDL	Total Maximum Daily Load
TNT	Trinitroglycerin
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USPP	Upper San Pedro Partnership
UVD	Upper Valley Districts
VRP	Voluntary Remediation Program
WIFA	Water Infrastructure Finance Authority
WQARF	Water Quality Assurance Revolving Fund
WRCC	Western Regional Climate Center
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

Appendix A

APPENDIX A: Arizona Water Protection Fund Projects in the Southeastern Arizona Planning Area through 2005

Groundwater Basin	Project Title/Grant #	Project Category
Aravaipa Canyon	Klondyke Tailings Response Strategy Analysis (RSA)/96-0014	Research
Cienega Creek	Refinement of Geologic Model, Lower Cienega Basin, Pima County, Arizona/95-016	Research
Cienega Creek	Hydrogeologic Investigation of Groundwater Movement and Sources of Base Flow to Sonoita Creek and Implementation of Long-Term Monitoring Program/96-0006	Research
Cienega Creek	Cienega Creek Stream Restoration/96-0020	Stream Restoration & Revegetation
Cienega Creek	Oak Tree Gully Stabilization/97-034	Upland Channel Restoration
Cienega Creek	Empire/Cienega/Empirita Fencing Project/98-049	Fencing
Cienega Creek	Lower Cienega Creek Restoration Evaluation Project/99-068	Research
Cienega Creek	Redrock Riparian Improvement/99-090	Fencing & Water Developments
Douglas	Hay Mountain Watershed Rehabilitation/98-066	Watershed Restoration
Duncan Valley	Gila Box Riparian and Water Quality Improvement Project/95-014	Fencing & Upland Water Developments
Lower San Pedro	Watershed Improvement to Restore Riparian and Aquatic Habitat on the Muleshoe Ranch CMA/97-035	Fencing & Watershed Restoration
Lower San Pedro	Bingham Cienega Riparian Restoration Project/97-040	Revegetation
Lower San Pedro	San Pedro River Preserve Riparian Habitat Restoration Project/97-044	Habitat Restoration

Groundwater Basin	Project Title/Grant #	Project Category
Lower San Pedro	Riparian and Watershed Enhancements on the A7 Ranch – Lower San Pedro River/99-069	Fencing & Upland Water Developments
Lower San Pedro	Lower San Pedro Watershed Project/00-109	Feasibility Study
Lower San Pedro	Cooperative Grazing Management for Riparian Improvement on the San Pedro/00-111	Fencing & Upland Water Developments
Morenci	Blue Box Crossing/99-077	Channel Restoration
Morenci	Upper Eagle Creek Restoration on East Eagle Allotment: 4 Drag Ranch/00-102	Fencing & Upland Water Developments
Morenci	Georges Lake Riparian Restoration Project/05-129	Fencing & Habitat Protection
Safford	Eagle Creek Watershed and Riparian Stabilization/96-0012	Fencing & Upland Water Developments
Safford	San Carlos Spring Protection Project/96-0018	Fencing
Safford	Abandonment of an Artesian Geothermal Well/96-0015	Habitat Protection
Safford	Creation of a Reference Riparian Area in the Gila Valley – Discovery Park/97-028	Habitat Restoration
Safford	Stable Isotopes as Tracers of Water Quality Constituents in the Upper Gila River/97-036	Research
Safford	Tritium as a Tracer of Groundwater Sources and Movement in the Upper Gila River Drainage/98-052	Research
Safford	Fluvial Geomorphology Study and Demonstration Projects to Enhance and Restore Riparian Habitat on the Gila River from the New Mexico Border/98-054	Research
Safford	Abandonment of Gila Oil Syndicate Well #1/99-086	Habitat Protection

Groundwater Basin	Project Title/Grant #	Project Category
Safford	Gila Reference Riparian Area, Discovery Park/00-099	Revegetation
San Rafael	Santa Cruz Headwaters Project/97-045	Fencing & Upland Water Developments
San Rafael	Upper Santa Cruz Watershed Restoration/99-096	Fencing & Upland Water Developments
Upper San Pedro	Regeneration and Survivorship of Arizona Sycamore/95-009	Research
Upper San Pedro	Preservation of the San Pedro River Utilizing Effluent Recharge/95-005	Constructed Wetland
Upper San Pedro	San Pedro Riparian National Conservation Area Watershed Rehabilitation/ Restoration Project/95-015	Revegetation & Upland Channel Restoration
Upper San Pedro	Autecology and Restoration of <i>Sporobolus Wrightii</i> Riparian Grasslands in Southern Arizona/95-018	Research
Upper San Pedro	Teran Watershed Enhancement/95-020	Upland Channel Restoration
Upper San Pedro	Happy Valley Riparian Area Restoration Project/96-0013	Fencing
Upper San Pedro	San Pedro Riparian National Conservation Area Watershed Protection and Improvement Project/96-0001	Fencing
Upper San Pedro	Lyle Canyon Allotment Restoration Project/97-027	Fencing & Upland Water Developments
Upper San Pedro	Lyle Canyon Allotment Riparian Area Restoration Project --- Phase 2/99-070	Fencing & Upland Water Developments
Willcox	Cottonwood Creek Restoration/03-116	Upland Channel Restoration

Appendix B

APPENDIX B: Rural Watershed Partnership Issues Summary (2005)

Rural watershed partnership participants, projects, accomplishments and issues are summarized below and grouped by planning area.

SOUTHEASTERN ARIZONA PLANNING AREA

Watershed Partnership	Primary Participants	Projects & Accomplishments	Issues
Middle San Pedro Watershed Partnership (Community Watershed Alliance)	Cochise County Benson J-Six Mescal HOA St. David Irrigation District Pomerene Irrigation District Local Citizenry TNC ADWR ADEQ USGS	<ul style="list-style-type: none"> • Cursory groundwater study completed. • AMA evaluation completed. • Active agricultural fields identified and surveyed • HSR completed • 7-year comprehensive groundwater study and numeric model development initiated. 	<ul style="list-style-type: none"> • Growth proposed in the Benson area • Limited groundwater data • Different perceptions of issues and goals within the area between Benson, irrigation districts, local citizenry, and the Upper San Pedro Partnership • Unable to get principle players to the table to discuss water • Unregulated lot splits • New arsenic drinking water standard • Limited funding resources for planning, projects, infrastructure and studies • ESA issues • Superfund site/poor quality groundwater conditions • Potential impact of adjudication court subflow definition • Limited funding resources for planning, projects, infrastructure and studies
Eagle Creek Partnership	Local ranchers & special interest groups ADWR	<ul style="list-style-type: none"> • Stream Reconnaissance study completed. 	<ul style="list-style-type: none"> • Little or no groundwater data available • Unresolved Indian water rights settlements • Limited funding resources for planning, projects, infrastructure and studies

SOUTHEASTERN ARIZONA PLANNING AREA (continued)

Watershed Partnership	Primary Participants	Projects & Accomplishments	Issues
Gila Watershed Partnership	Thatcher Graham County Duncan ADWR ADEQ BLM USBor	<ul style="list-style-type: none"> Fluvial Geomorphology Study Water demand study Development of water resource management plan for the watershed area initiated Capped several saline wells contributing to the degradation in water quality of the Gila River Resin bush eradication project completed USFS NRCS/RCD 	<ul style="list-style-type: none"> Indian water rights settlement issues Poor quality surface and groundwater Growth associated with new Phelps Dodge mine and unregulated lot splits ESA issues throughout the watershed, critical habitat designation, and mitigation efforts Desire to maintain rural setting and especially maintaining agriculture at current or higher levels Lack of technical data on the groundwater system Invasive species issues impacting the surface water supply (tamarrisk) Potential impacts of adjudication court subflow definition New arsenic drinking water standard Drought impacts on surface water supplies, agriculture and cattle ranching Numerous high hazard unsafe dams in area Limited funding resources for planning, projects, infrastructure and studies Regular flooding in the Duncan-Virden area
Lower San Pedro Watershed Partnership-Redington NRCD	Redington Local ranchers ADWR	<ul style="list-style-type: none"> <i>Watershed reconnaissance study completed.</i> 	<ul style="list-style-type: none"> Unresolved adjudication and Indian water rights settlement issues Little or no groundwater data Opposition to government assistance in obtaining groundwater information Potential impacts of adjudication court subflow definition Limited funding resources for planning, projects, infrastructure and studies

SOUTHEASTERN ARIZONA PLANNING AREA (continued)

Watershed Partnership	Primary Participants	Projects & Accomplishments	Issues
	Sierra Vista Cochise County Bisbee	Ft. Huachuca Huachuca City Tombstone	<ul style="list-style-type: none"> Comprehensive groundwater study Numeric groundwater model Phase I of Decision Support System model completed.
TNC Audubon Bella Vista Water		Huachuca	<ul style="list-style-type: none"> San Pedro Riparian National Conservation Area Water Demand study
ADWR AACD State Land	ADEQ NRCD		<ul style="list-style-type: none"> Recharge study of detention basins Engineering design to transfer effluent from Huachuca City to Ft. Huachuca for treatment and recharge Partially funded transfer of treated effluent from new Bisbee wastewater treatment plant for use by Turquoise Valley golf course.
USF&W BLM USGS Coronado National Monument	USFS USDA/ARS USBOR		<ul style="list-style-type: none"> Second iteration of water conservation & management plan completed. Section 321 Report to Congress submitted annually. Funded more than \$1,000,000 in conservation projects in watershed. Conduct public outreach and educational forums Appraisal study of five water augmentation projects initiated.
Upper San Pedro Partnership			

OTHER AREAS OF INTEREST:

- Douglas Basin is experiencing significant groundwater declines. Groundwater pumping is estimated at about 54,000 acre-feet per year, an increase from 43,000 in five years. ADWR has initiated a three-year groundwater study with the USGS for the Douglas Basin.
- Willcox Basin has been averaging 140,000 acre-feet of annual groundwater mining for the past 10 years causing some concern. A watershed partnership for this area is currently being organized and ADWR has initiated a three-year groundwater study of the Willcox Basin with the USGS.
- A Cienega Creek watershed group has been meeting fairly regularly to evaluate water conditions.